Weekly Report for 04/06/2015

Highlights

• Found a kicker configuration for ID1 beam loss monitor calibration: IK4 14 kV plus a large inboard horizontal bump of > 4 mm. Results confirmed with BLM studies with J. Dooling. (Kathy Harkay)

• Compared FPGA bpm x,y trajectories of single-bunch, single-kicker kicked beam with elegant and found good agreement for the x-plane, but deviations for the y-plane. This led to discussions of possibly improving the calibrated model, starting with re-measuring it. (Kathy Harkay)

• Wrote IPAC15 paper on abort kicker. (Kathy Harkay)

APS Renewal and Upgrade

• Developed a new wall file for Cornell synrad3d modeling of the multiplet chamber with more realistic, round wings, as designed by B. Stillwell. Sent result to APS-U vacuum simulation group. Next step: run synrad3d and compare result to rectangular wings. (Kathy Harkay)

• Started discussing Injector Working Group topics with CY Yao, S. Pasky, and Yin-e Sun. (Kathy Harkay)

• Summarized injection loss distribution for MBA lattice. Gave a short presentation on the MBA beam loss group meeting. (Aimin Xiao)

• Attended APS-U accelerator physics and radiation physics meetings. (Jeff Dooling)

MCR Operations

Linac Operations

• Talked to Steve Southworth (XSD-AMO) regarding lab space to do laser head maintenance. He said there may be room available in 401. (Jeff Dooling)

APS Machine Studies

Storage Ring Studies

• Measured response matrix for updated calibrated machine model and FPGA bpm turn-by-turn x,y trajectories for IK1 3-kV kick. Data will be analyzed by V. Sajaev later. (Kathy Harkay)

• With J. Dooling, acquired FPGA waveforms for IK1 3 kV, x and y plane. Also did IK2 at 10 kV to verify ID6 losses; this is the configuration we used in 2014 for ID6 SCU0 BLM calibration. Finally, used IK4 at 14 kV and ID1 bump to test elegant simulations (ID1 loss). This was successful, and we acquired ID1 BLM calibration data. Compared FPGA data with elegant results using calibrated machine model. Reported results at the weekly AOP machine studies meeting. Incorporated ID1 BLM calibration analysis from J. Dooling in presentation. (Kathy Harkay)

• Provided ID4 BLM data to L. Emery showing emergence of multi-bunch losses shortly after injection. (Jeff Dooling)

Linac Studies

• Monday held meeting to discuss planning for upcoming Injector Studies period, April 15-28, 2015. (Jeff Dooling)

• Trying to increase output energy from the pc gun laser. (Jeff Dooling)

• Looked at doubling crystal rotation about the beam angle about the beam axis; also measured transmission efficiency through the compressor. Found the efficiency to be roughly 50 percent. (Jeff Dooling)

APS Machine Research and Development

Storage Ring Research and Development

• Analyzed the loss distributions using elegant for a measured abort kicker waveforms provided by J. Wang, using 8 kV HV setpoint. Found that this operating point is acceptable: entire beam is lost in 3 turns, 96% is lost at the septum chamber, and 0% is lost at ID1 and ID6. (Kathy Harkay)

• Found a configuration (elegant) using IK4 where a single bunch is all lost in ID1. Realized that using a kicker upstream of the septum chamber makes it difficult to reach ID1; smaller kicks hit ID4 and larger kicks hit the septum chamber. IK4 is downstream of the septum but close to ID1. Without a bump, bunch is lost in ID2, but with a >4 mm -x bump, beam is lost mostly in ID1. (Kathy Harkay)

• Updated SCU0 quench database with two beam dumps (one didn't quench) and two quenches (one while ramping, without a beam dump). (Kathy Harkay)

APS Machine Software

Storage Ring

• implemented and test P0Feedback sample pattern scan, added post-processing to find the best sample pattern and load the found pattern per request. (Hairong Shang)

• added missing orbit recording if "get dispersion data and chromaticity data" are both selected to SRDispChromMeas (Hairong Shang)

• updated makeIDSectorsFile to include ID35. (Hairong Shang)

• updated ID27 and I35 P1, P2 xray bpm distances in XrayBPMdistance.sdds config, regenerated ID config files devices.sdds and sectors.sdds. (Hairong Shang)

• Wrote script which analyzes SCU0 BLM signals to provide calibrated loss charge. (Jeff Dooling)

Injectors

• updated booster FPGA bpm waveform config file, it now includes all sectors. (Hairong Shang)

• QD ramp became unstable after several corrections, per CY's request, added choice of loading safety ramp for selected magnets during sleeping mode of energy saver. (Hairong Shang)

• added automatically loading IRamp reference after generating new reference per CY's request. (Hairong Shang)

• did PC gun laser clearning experiment with Yine, wrote PCGunLaserCleaning script. (Hairong Shang)

General

• fixed bugs for wavelenght and weight computation in sddsfresnel, and fixed the segmentatiob bug of bingxin's add-ons. (Hairong Shang)

• start working on median filter. (Hairong Shang)

Publications, papers and report

• Wrote paper for IPAC15 on the abort kicker. Incorporated feedback from co-authors and editor E. Hermans. (Kathy Harkay)

• Provided feedback on J. Dooling's paper on the ID6 BLM calibration (for IPAC15). (Kathy Harkay)

• Continued working on a paper for the ICFA BD newsletter with J. Dooling. (Kathy Harkay)

• Summarized half-integer resonance experiment results to a tech note. (Aimin Xiao)

• Worked on the IPAC15 papers. (Aimin Xiao)

• Drafted article on beam loss measurements for ICFA Beam Dynamics Newsletter (BDN) with co-author K. Harkay. (Jeff Dooling)

Miscellaneous

• Participated as APS tour guide for the Science Careers in Search of Women conference. (Kathy Harkay)

• Attended Lab-Corps pitch competition. (Kathy Harkay)

• Prepared machine study schedule for next week. (Aimin Xiao)

• took vacation from 3/25 - 4/2 (Hairong Shang)